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Refining the clinical application of the consideration of future consequences scale -14

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Abstract
Within the temporal psychology literature, evidence has been presented for a relationship between a variety of health indicators, including alcohol-related problems, as well as symptoms of anxiety and depression, and a variety of temporal constructs. Recently, it was claimed that the two factors of the Consideration of Future Consequences (CFC) Scale-14 (CFCS-14) were both practically and conceptually useful in understanding the relationship between CFC and various criterion variables. The present study examined the relationship between these two factors (consideration of immediate and consideration of future consequences) and symptoms of anxiety and depression, as well as problematic alcohol use. Participants were recruited from a University in the North West of England, and completed the CFCS-14, the Alcohol Use Disorders Identification Test, and the Hospital Anxiety and Depression Scale. Results offer support for the psychometric validity and internal consistency of the CFCS-14, and further reveal a modest relationship between its factors and criterion variables. Compared to temporal psychology measures focussing on time attitudes or time perspective, the clinical or practical utility of the CFCS-14 in understanding these health domains may be limited.

Keywords Consideration of future consequences · Anxiety · Depression · Alcohol · AUDIT · Time perspective

Introduction

Given that symptoms of psychological distress, including anxiety and depression have been observed in university undergraduates (e.g., Blanco et al. 2008; Ibrahim et al. 2013; Vazquez and Blanco 2008), it seems important to investigate both the correlates of these symptoms, and potential means by which these might be ameliorated. In this context the area broadly known as 'temporal psychology' is potentially useful as it has been theorized that (specifically) *future*-oriented constructs, such as hope and optimism, are developmentally adaptive (e.g., Burrow et al. 2010; Schmid and Lopez 2011; Sun and Shek 2013), and are associated with lower levels of psychiatric symptomatology.

Temporal psychology in its broadest sense examines the extent to which thoughts about, and feelings towards the past, present and future, influence human behavior. However, temporal psychology is a multi-faceted area of research within which narrower or more nuanced dimensions have been widely studied. These include, but are not limited to, time perspective, time attitudes, temporal focus, and consideration of future consequences (CFC).

Time perspective, as conceptualized in the Zimbardo Time Perspective Inventory (ZTPI), is said to be "the often nonconscious process whereby the continual flows of personal and social experiences are assigned to temporal categories, or time frames, that help to give order, coherence, and meaning to those events" (Zimbardo and Boyd 1999, p.1271). The ZTPI assesses time perspective in five domains, past positive, past negative, present hedonistic, present fatalistic, and future.

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Time Attitudes, as conceptualized in the Adolescent and Adult Time Inventory-Time Attitudes Scale (AATI-TA; Mello and Worrell 2007; Mello et al. 2016) is said to refer to an individual's emotional and evaluative feelings toward the past, the present, and the future (Andretta et al. 2013). Temporal Focus, as hypothesized in the Temporal Focus Scale (TFS; Shipp et al. 2009), describes the extent to which people characteristically devote their attention to the past, present, and future (Bluedorn 2002; Shipp et al. 2009), and with a particular emphasis on cognitions, differs from time attitudes (affect), and time perspective (a combination of cognition and affect).

In a recent study (McKay et al. 2018), authors reported only small-sized correlations between scores on these constructs, suggesting that they are related but discrete dimensions of temporal psychology and, as such, their relationship with criterion variables merits individual investigation. Thus, what is true of one construct may not be for another. Indeed, McKay et al. (2018) called for greater clarity and specificity in the description of temporal constructs, and rather than using macro-level terms such as 'future orientation', called on researchers to be more precise in their description of scales and constructs.

Within the broader temporal psychology literature there is reason to believe that there is a meaningful relationship between alcohol use, psychopathology and temporal constructs. A number of studies have reported a significant and meaningful relationship between lower consideration of future consequences and a lower future time perspective and more problematic alcohol use (e.g., Beenstock et al. 2011; McKay et al. 2014). In addition, others have shown that a past negative orientation can be associated with greater alcohol-related problems (Chavarria et al. 2015; Linden et al. 2014).

A number of studies have reported meaningful relationships between mental health indicators and various dimensions of temporal psychology. For example, Van Beek et al. (2011), using the ZTPI reported that a past positive (negatively), past negative and present fatalistic (both positively) temporal bias were indicative of psychiatric problems, including depression and suicidal ideations. Elsewhere, past negative has been shown to be positively correlated with depression (Zimbardo and Boyd 2008; Lyubomirsky and Nolen-Hoeksema 1995). Elevated levels of present fatalistic time perspective were also reported as being significantly associated with psychopathology, including heightened risk of suicidal ideation, less extraversion and consciousness, and more neuroticism (Laghi et al. 2009; Van Beek et al. 2011).

The Consideration of Future Consequences Scale (CFCS; Strathman et al. 1994) was developed to assess individual differences in the degree to which people consider the potential future outcomes of behavior, and the degree to which that consideration affects present behavior. The 12-item CFCS was originally developed as a unidimensional scale, so that those scoring high on the CFCS-12 were considered to be high in CFC, with the opposite true for those scoring low (for a review see Joireman and King 2016). However, a range of studies have reported a variety of optimal factor solutions for the scale (Hevey et al. 2010; Joireman et al. 2008; McKay et al. 2015a, b; Strathman et al. 1994).

In an attempt to create a more psychometrically valid two-factor solution, Joireman et al. (2012) developed the CFCS-14 by adding two additional future oriented items. Hence, the CFCS-14 was purposively developed to simultaneously assess CFC-Future (CFC-F; consideration of future consequences) and CFC-Immediate (CFC-I; consideration of present consequences, where items are no longer reverse scored). The developers argued that as well as providing a more psychometrically reliable and internally consistent two-factor scale, a two-factor solution would be conceptually and practically useful in understanding the relationship between consideration of future consequences and criterion variables (Joireman et al. 2012). Indeed, McKay et al. (2016b) reported a good fitting two-factor solution for the CFCS-14, but these authors questioned the practical utility of a two factor solution specifically in relation to alcohol-use and scores on symptoms of psychopathology, claiming that the CFC-F factor was largely redundant in explaining any variance in these scores.

Although the study of temporal psychology is not new (e.g., Lewin 1942), an increasing body of evidence is beginning to demonstrate the potential utility of the construct, in particular of future orientation, in both general health (e.g., Hall et al. 2014) and substance misuse treatment (e.g., Davies and Filippopoulos 2015). This is potentially significant given the fact that the inability to consider the future consequences of behavior has been widely inked to health-compromising behaviors (e.g., Apostolidis et al. 2006; Daugherty and Brase 2010; Fieulaine and Martinez 2011). A scale that can simultaneously assess consideration of future consequences (CFC-F) and consideration of immediate consequences (CFC-I) would seem to be of considerable value to those planning health promotion and/or therapeutic interventions. To date, with only one study having investigated the relationship between the CFCS-14 scores and self-reported psychopathological symptoms (McKay et al. 2016b), this conceptual utility argument cannot be substantiated for these constructs.

Despite the promise offered by the CFCS-14 in terms of psychometric validity, internal consistency and conceptual utility, one issue of concern remains. A number of studies have reported the CFC-F factor to be unrelated to criterion variables including environmental concern, alcohol-related problems, and psychopathology (Arnocky et al. 2014; McKay et al. 2016a). Additionally, Van Beek et al. (2013), using a domain-specific CFC scale showed that CFC-I food predicted eating behaviors, while CFC-F exercise predicted exercising behaviors. The totality of these results point to a complex, but

evolving CFC literature. Despite the fact that unlike the ZTPI, the AATI-TA, or the TAS, the CFCS-14 lacks a past element, results of studies described above illustrating positive outcomes for more future-focussed individuals, it might reasonably be lower levels of anxiety and depressive symptomatology would be associated with greater consideration of future consequences.

In the only study to date to examine the relationship between CFCS-14 scores and symptoms of anxiety and depression, McKay et al. (2016b) reported no significant relationship between CFC-I ($p = .462$) nor CFC-F ($p = .115$) scores and symptoms of depression, and a significant ($p = .033$) relationship between CFC-I and symptoms of anxiety, but no significant relationship between CFC-F ($p = .461$) and anxiety. However, it should be pointed out that the standardized beta coefficient for these findings did not reach Ferguson's minimum practical effect size ($\beta \geq .20$; Ferguson 2009). Despite the fact that McKay et al. (2016b) reported a good fitting and internally consistent two-factor model, their results suggested that, in terms of CFC-F and CFC-I, there was only limited conceptual utility in terms of understanding these particular health-related criterion variables.

Given the suggestion that the CFCS-14 is psychometrically more robust than the CFCS-12, and the suggestion that it has both conceptual and practical utility, the present study had two specific aims. Firstly, we aimed to undertake a further examination of the factor structure of the CFCS-14, and secondly, to re-examine the clinical utility of the best fitting model with regard to problematic alcohol use, as well as symptoms of anxiety and depression. This is important in a literature replete with psychometric and conceptual concerns where replication of studies is rare, and this study is only the second to examine how CFCS-14 scores relate to these criterion variables.

Method

Participants

Participants were 369 adults (aged 18–40 [mean (+SD) 21.68 (4.17)]; 46.3% male), recruited in a University in the North West of England. Participants completed all measures using pen and paper format. No incentives were offered for participation and completion took between 25 and 30 min. The study was given ethical approval by the relevant university ethics committee and all participants gave informed consent.

Measures

The CFCS-14 (Joireman et al. 2012) is made up of seven CFC-F items (e.g., *When I make a decision, I think about how it might affect me in the future*), measuring consideration of future consequences, and seven CFC-I items (e.g., *I only act to satisfy immediate concerns, figuring the future will take care of itself*), measuring consideration of immediate consequences. Responses were on a 7-point Likert-type scale from 1 (*very unlike me*) to 7 (*very like me).* In their development of the scale Joireman et al. (2012) reported two highly reliable (α) factors; CFC-Future = .80 and CFC-Immediate = .84, as well as a small-sized (Ferguson 2009) correlation coefficient between the two factors ($r = -.27$).

The Hospital Anxiety and Depression Scale (HADS; Zigmond and Snaith 1983) yields scores for anxiety (HADS-A) and depression (HADS-D) on separate subscales with scores ranging from zero to twenty-eight, with a higher score indicating a greater degree of anxiety or depression.

The Alcohol Use Disorders Identification Test (AUDIT; Saunders et al. 1993) is a 10-item questionnaire with valid and reliable scores across different contexts and cultures (e.g., De Meneses-Gaya et al. 2009). When used to detect problematic alcohol use in a population of university undergraduates, AUDIT demonstrated good sensitivity (.94) and specificity (.92; Adewuya 2005). In the present study scores on all 10 items were summed to produce an overall AUDIT score.

Statistical Analyses

Three models were estimated using the maximum likelihood estimator with standard errors and chi-square test statistics robust to non-normality (MLR) in Mplus (Muthén and Muthén 2012). First, we estimated a unidimensional model in which all 14 items loaded onto a single factor. Second, we estimated a two-factor model in which the factor correlation was constrained to zero. Items 1, 2, 6, 7, 8, 13 and 14 were assigned to the first factor (i.e., CFC–F), and Items 3, 4, 5, 9, 10, 11, and 12 were assigned to the second factor (i.e., CFC–I). Third, we estimated the same two-factor model described earlier with the factor correlation freely estimated. For each estimated model, we examined the following fit indexes: the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean square error of approximation (RMSEA) and its 95% confidence interval, and the root mean square residual (SRMR).

Values of CFI and TLI at or above .95 and values of RMSEA at or below .05 indicate close model fit. CFI and TLI values between .90 and .95 and RMSEA values between .05 and .08 indicate acceptable model fit. Values of SRMR at or below .08 indicate close model fit (Hu and Bentler 1999). Regression models were then estimated, in which a range of outcomes (AUDIT, HADS-A, HADS-D scores) were regressed onto the latent factors and selected covariates (age and gender). Further, because the study was exploratory, we also used Binary Logistic models to assess the

Table 1 Confirmatory factor analysis model fit indices for alternative models of the CFCS-14

	χ^2	*df*	CFI	TLI	RMSEA	RMSEA 90% CI	SRMR
Unidimensional	646.060***	77	0.590	0.516	0.142	0.132–0.152	0.117
Uncorrelated 2 factor	231.718***	77	0.889	0.868	0.074	0.063–0.085	0.129
Correlated 2 factor	183.281***	76	0.923	0.908	0.062	0.050–0.073	0.053

CFI, Comparative Fit Index; *TLI*, Tucker Lewis Index; *RMSEA*, Root Mean Square Error of Approximation; *SRMR*, Standardized Root Mean Square Residual; *CI*, Confidence Interval; *** $p < .001$

relationship between Anxiety and Depressive caseness (HADS >8; Snaith and Zigmond 1994), problematic alcohol use (AUDIT >8; Beenstock et al. 2011) and CFC-I and CFC-F scores.

To aid the interpretation of the regression analyses, we applied the criteria of Ferguson (2009). Accordingly, a recommended minimum effect size for standardized β (or a practically significant effect size) is ≥ .2, a moderate effect size ≥ .5, and a strong effect ≥. 8.

Results

Table 1 displays the model fit results for a variety of solutions. Results clearly demonstrate that the fit indices for both the unidimensional model and the two uncorrelated factors model were suboptimal. The fit indices for the two factor solution were acceptable. Table 2 displays the factor loadings for the two-factor model. It is observed that both CFC-I and CFC-F items load strongly on their respective factors.

Table 2 Item loadings for the two correlated factor solution

	CFC-F		CFC-I	
Item	B	SE	B	SE
CFC-F 1. I consider how things might be in the future, and try to influence those things with my day to day behavior.	0.851	0.058		
CFC-F 2. Often I engage in a particular behavior in order to achieve outcomes that may not result for many years.	0.969	0.069		
CFC-F 6. I am willing to sacrifice my immediate happiness or well-being in order to achieve future outcomes.	0.876	0.068		
CFC-F 7. I think it is important to take warnings about negative outcomes seriously even if the negative outcome will not occur for many years.	0.621	0.078		
CFC-F 8. I think it is more important to perform a behavior with important distant consequences than a behavior with less important immediate consequences.	0.590	0.060		
CFC-F 13. When I make a decision, I think about how it might affect me in the future.	0.791	0.057		
CFC-F 14. My behavior is generally influenced by future consequences.	0.871	0.064		
CFC-I 3. I only act to satisfy immediate concerns, figuring the future will take care of itself.			1.175	0.053
CFC-I 4. My behavior is only influenced by the immediate (i.e., a matter of days or weeks) outcomes of my actions.			1.036	0.064
CFC-I 5. My convenience is a big factor in the decisions I make or the actions I take.			0.631	0.081
CFC-I 9. I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level.			0.923	0.068
CFC-I 10. I think that sacrificing now is usually unnecessary since future outcomes can be dealt with at a later time.			0.860	0.070
CFC-I 11. I only act to satisfy immediate concerns, figuring that I will take care of future problems that may occur at a later date.			1.114	0.052
CFC-I 12. Since my day to day work has specific outcomes, it is more important to me than behavior that has distant outcomes.			0.481	0.068

B, unstandardized coefficient; *SE*, standard error of B; All estimates are statistically significant ($p < .001$) except *$p < .01$ and [1] non-significant. *CFC-I*, Consideration of Immediate Consequences; *CFC-F*, Consideration of Future Consequences. Correlation between CFC-I and CFC-F, $r = -.37$

Internal consistency (alpha) estimates were all satisfactory in the present study and were as follows: (CFCF, $\alpha = .82$; CFC-I, $\alpha = .82$; HADS-A, $\alpha = .81$; HADS-D, $\alpha = .70$; AUDIT, $\alpha = .83$). Table 3 displays the regression coefficients of individual regression models for AUDIT, HADS-A and HADS-D scores on the two correlated factors (CFC-F and CFC-I). Additional covariates included age and gender. Both CFC-F and CFC-I statistically predicted AUDIT scores with higher CFC-F and lower CFC-I significantly associated with higher AUDIT score. Both factors also predicted HADS-A, but this time both higher CFC-F and higher CFCI predicted higher anxiety scores. For HADS-D, CFC-F was non-significant, while CFC-I was a significant predictor, with higher CFC-I predicting higher depression scores.

Finally, Table 4 displays the results of three Binary Logistic models assessing the relationship between CFC-I and CFC-F scores and caseness for all dependent measures, adjusted for age and gender. Results show a similar pattern to those in Table 3, so that the R^2 values suggest that CFC generally explains a modest amount of variance in caseness for problematic alcohol use, anxiety, and depression.

Table 3 Regression parameter estimates (two correlated factors; CFC-F, CFC-I)

	β	B	SE	p
AUDIT, $R^2 = 0.202$				
Intercept	2.904	19.049	1.665	<0.001
Age	−0.171	−0.270	0.074	<0.001
Gender	−0.479	−3.144	0.638	<0.001
CFC-F	−0.222	−1.453	0.405	<0.001
CFC-I	0.122	0.789	0.391	0.041
HADS-A, $R^2 = 0.049$				
Intercept	2.134	8.754	1.135	<0.001
Age	−0.112	−0.110	0.051	0.032
Gender	0.222	0.910	0.423	0.032
CFC-F	0.143	0.586	0.252	0.020
CFC-I	0.154	0.631	0.241	0.009
HADS-D, $R^2 = 0.027$				
Intercept	0.894	2.870	0.901	0.001
Age	0.058	0.045	0.040	0.264
Gender	0.036	0.115	0.335	0.731
CFC-F	0.098	0.314	0.204	0.124
CFC-I	0.170	0.546	0.193	0.005

β, Standardized coefficient; *B*, Unstandardized coefficient; *SE*, Standard error of B; For continuous covariates STDYX method of standardisation was used. For binary covariates STDY was used. *AUDIT*, Alcohol Use Disorders Identification Test; *HADS*, Hospital Anxiety and Depression Scale (*A*, Anxiety; *D*, Depression)

Table 4 Summary of logistic regression analysis of the relationship between CFC scores and caseness for Alcohol-related problems, Anxiety, and Depression

	OR (95% CI)	Wald X^2	*P*-value	Nagelkerke R^2
AUDIT				0.15
Gender	2.29 (1.40, 3.73)	11.02	0.001	
Age	0.91 (0.87, 0.96)	11.01	0.001	
CFC-I	1.58 (1.20, 2.06)	10.86	0.001	
CFC-F	0.73 (0.54, 0.99)	4.08	0.043	
Constant	9.91	3.92	0.048	
Anxiety				0.07
Gender	0.64 (0.41, 0.98)	4.21	0.040	
Age	0.94 (0.89, 0.99)	4.25	0.039	
CFC-I	1.32 (1.04, 1.68)	5.20	0.023	
CFC-F	1.44 (1.10, 1.90)	6.88	0.009	
Constant	0.19	2.24	0.134	
Depression				0.02
Gender	0.86 (0.49, 1.51)	0.29	0.590	
Age	1.05 (0.98, 1.11)	2.14	0.144	
CFC-I	1.10 (0.81, 1.50)	0.37	0.541	
CFC-F	1.23 (0.86, 1.75)	1.31	0.252	
Constant	0.02	7.97	0.005	

CFC, Consideration of Future Consequences (*F*, Future; *I*, Immediate); *OR*, Odds Ratio; *CI*, Confidence Interval

Discussion

The present study examined the psychometric validity, internal consistency and clinical utility in terms pf psychiatric symptomatology, of scores on the CFCS-14 using a university-based sample in the UK. Overall, results show that the model fit for the two-factor model was acceptable. There was no support for a unidimensional CFCS-14 scale, and accordingly, the work undertaken by Joireman et al. (2012) to develop a valid two-factor scale is supported.

In terms of the conceptual or clinical utility of the CFCS-14 in understanding symptoms of anxiety and depression, as well as problematic alcohol use, results revealed a number of issues. Firstly, the r-square values in all models were quite low, both for raw scale scores, and when AUDIT and HADS scores were categorized in terms of clinical caseness. This suggests that the variance in these scores explained by CFCS-14 scores is relatively low overall. Ferguson (2009) suggested that only R^2 values of ≥0.04 could be interpreted as being meaningful, and accordingly, the model for HADS-D scores was sub-optimal. Additionally, effect sizes for all but one of the significant results did not reach Ferguson's (2009) threshold ($\beta \geq .2$) for practical significance. In other words, while the *p* values may have suggested a significant relationship, the effect sizes question how meaningful that relationship actually is. The only CFCS-14 standardized beta value that reached practical

significance was the CFC-F value in the AUDIT model (β = −.22), and this result supports a wider literature suggesting that higher levels of alcohol use and/or alcohol-related problems are related to a lack of future focus, orientation or planning (Cole et al. 2016; McKay et al. 2014; Zimbardo and Boyd 2008).

Where, in other studies the use of scales measuring time attitudes (the affective dimension) and time perspective (a mixture of affective, cognitive and behavioral items) have yielded meaningful results for symptoms of anxiety and depression, the CFCS-14 (consisting of cognitive and behavioral items) does not. Indeed, closer examination of the CFCS-14 items (Table 2) reveals that they lack both valence (positive or negative) and specificity. This is in contrast to both the ZTPI (Zimbardo and Boyd 1999), and the Adolescent Time Inventory-Time Attitudes Scale (ATI-TA; Mello and Worrell 2007) where items are either framed negatively or positively, or are specific to particular behaviors. In addition, both the ZTPI and the ATI-TA have more subscales (five and six respectively) and are therefore potentially more sensitive to variation in criterion variable scores. It is perhaps for this reason that the relationship between psychiatric symptoms, alcohol use, and temporal psychology emerged more obviously with the use of these scales (ZTPI, McKay et al. 2016a; ATI-TA, McKay et al. 2017) than with the CFCS-14. This is not a criticism of the CFCS-14 scale per-se, more an observation about the CFC construct. Where previously McKay et al. (2016b) concluded that the CFCS-14 was limited in its conceptual utility in respect of HADS-A and HADS-D scores, a better interpretation of those results, and the results of the present study combined, might be that consideration of the future as assessed by the CFCS-14 is practically unrelated to the symptoms of anxiety and depression, and poorly related to alcohol-related problems, in young people. Further, as this developing literature begins to grow in terms of numbers of studies, a review of studies using a range of temporal psychology instruments, and in particular the effect sizes reported therein, may be more instructive in terms of what measures relate best to alcohol-related measures, a well as measures of psychopathology.

Secondly, insofar as these modest results are practically applicable, they point to the fact that higher levels of depressive symptomatology are significantly associated with consideration of the immediate future (essentially present orientation), but not to consideration of the more distant future. Conversely, the results point to the fact that higher levels of anxiety symptomatology are significantly related to higher levels of consideration of both the immediate and more extended future. This is somewhat different to the results previously reported by McKay et al. (2016b), and more in keeping with a conceptual utility argument (the fact that both CFC-I and CFC-F are significantly associated with outcomes). However, the small beta values limit the practical significance of any findings (Ferguson 2009).

One practical implication of these findings relates to the potential utility of the CFCS-14 in clinical settings. Using this scale, it is questionable, given the overall amount of variance explained, whether the CFCS-14 might help with the understanding of symptoms of anxiety and depression, or problematic alcohol use. This seems particularly important in view of recent developments where temporal psychology is being employed in clinical settings (Davies and Filippopoulos 2015). However, this is only the second study to examine this relationship, and both this and the previous study (McKay et al. 2016b) were cross sectional, and used a University sample. Indeed, further studies in a range of population types are required to be able to draw more definitive conclusions.

The present study is not without limitations. Firstly, all data were self-reported. Secondly, participants were a university sample, and therefore, it is not clear if results will generalise to the general population. Finally, this is only the second study to examine associations between the CFCS-14 and symptoms of psychopathology. Accordingly, more work will need to be undertaken in the examination of these associations in diverse samples in different cultural contexts.

In conclusion, the present study adds to the growing literature supporting the psychometric validity and internal consistency of the two-factor CFCS-14, and that it should be scored and applied accordingly. However, the amount of variance explained in this context is quite modest, and researchers examining the relationship between temporal psychology and symptoms of anxiety and depression, or alcohol use, might be better advised to focus attention on the affective dimension (time attitudes).

Compliance with Ethical Standards

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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References

Adewuya, A. O. (2005). Validation of the alcohol use disorders identification test (audit) as a screening tool for alcohol-related problems among Nigerian university students. *Alcohol and Alcoholism, 40*, 575–577.

Andretta, J. R., Worrell, F. C., Mello, Z. R., Dixson, D. D., & Baik, S. H. (2013). Demographic group differences in adolescents' time attitudes. *Journal of Adolescence, 36*, 289–301. https://doi.org/10.1016/j.adolescence.2012.11.005.

Apostolidis, T., Fieulaine, N., & Soule, F. (2006). Future time perspective as predictor of cannabis use: Exploring the role of substance

perception among French adolescents. *Addictive Behaviors, 31*, 2339–2343.

Arnocky, S., Milfont, T. L., & Nicol, J. R. (2014). Time perspective and sustainable behavior: Evidence for the distinction between consideration of immediate and future consequences. *Environment and Behavior, 46*, 556–582.

Beenstock, J., Adams, J., & White, M. (2011). The association between time perspective and alcohol consumption in university students: Cross-sectional study. *The European Journal of Public Health, 21*, 438–443.

Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S.-M., & Olfson, M. (2008). Mental health of college students and their non-college-attending peers: Results from the national epidemiologic study on alcohol and related conditions. *Archives of General Psychiatry, 65*, 1429–1437.

Bluedorn, A. C. (2002). *The human organization of time: Temporal realities and experience*. Stanford: Stanford University Press.

Burrow, A. L., O'Dell, A. C., & Hill, P. L. (2010). Profiles of a developmental asset: Youth purpose as a context for hope and well-being. *Journal of Youth and Adolescence, 39*, 1265–1273. https://doi.org/10.1007/s10964-009-9481-1.

Chavarria, J., Allan, N. P., Moltisanti, A., & Taylor, J. (2015). The effects of present hedonistic time perspective and past negative time perspective on substance use consequences. *Drug and Alcohol Dependence, 152*, 39–46.

Cole, J. C., Andretta, J. R., & McKay, M. T. (2016). The relationship between temporal profiles and alcohol-related problems in university undergraduates: Results from the United Kingdom. *Addictive Behaviors, 55*, 15–18.

Daugherty, J. R., & Brase, G. L. (2010). Taking time to be healthy: Predicting health behaviors with delay discounting and time perspective. *Personality and Individual Differences, 48*, 202–207.

Davies, S., & Filippopoulos, P. (2015). Changes in psychological time perspective during residential addiction treatment: A mixed-methods study. *Journal of Groups in Addiction & Recovery, 10*, 249–270.

De Meneses-Gaya, C., Waldo Zuardi, A., Loureiro, S. R., & Crippa, J. A. S. (2009). Alcohol use disorders identification test (AUDIT): An updated systematic review of psychometric properties. *Psychology & Neuroscience, 2*, 83–97.

Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice, 40*, 532–538.

Fieulaine, N., & Martinez, F. (2011). About the fuels of self-regulation: Time perspective and desire for control in adolescents substance use. In V. Barkoukis (Ed.), *The psychology of self-regulation* (pp. 83–102). New York: Nova.

Hall, P. A., Fong, G. T., & Meng, G. (2014). Time perspective as a determinant of smoking cessation in four countries: Direct and mediated effects from the international tobacco control (ITC) 4-country surveys. *Addictive Behaviors, 39*, 1183–1190.

Hevey, D., Pertl, M., Thomas, K., Maher, L., Craig, A., & Ni Chuinneagain, S. (2010). Consideration of future consequences scale: Confirmatory factor analysis. *Personality and Individual Differences, 48*, 654–657. https://doi.org/10.1016/j.paid.2010.01.006.

Hu, L., & Bentler, P. M. (1999). Cut-off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modelling, 6*, 1–55.

Ibrahim, A. K., Kelly, S. J., & Glazebrook, C. (2013). Socioeconomic status and the risk of depression among UK higher education students. *Social Psychiatry and Psychiatric Epidemiology, 48*, 1491–1501.

Joireman, J., & King, S. (2016). Individual differences in the consideration of future and (more) immediate consequences: A review and directions for future research. *Social and Personality Psychology Compass, 10*(5), 313–326 J.

Joireman, J., Balliet, D., Sprott, D., Spangenberg, E., & Schultz, J. (2008). Consideration of future consequences, ego-depletion, and self-control: Support for distinguishing between CFC–immediate and CFC–future subscales. *Personality and Individual Differences, 45*, 15–21. https://doi.org/10.1016/j.paid.2008.02.011.

Joireman, J., Shaffer, M. J., Balliet, D., & Strathman, A. (2012). Promotion orientation explains why future-oriented people exercise and eat healthy: Evidence from the two-factor consideration of future consequences-14 scale. *Personality and Social Psychology Bulletin, 38*, 1272–1287.

Laghi, F., Baiocco, R., D'Alessio, M., & Gurrieri, G. (2009). Suicidal ideation and time perspective in high school students. *European Psychiatry : The Journal of the Association of European Psychiatrists, 24*, 41–46. https://doi.org/10.1016/j.eurpsy.2008.08.006.

Lewin, K. (1942): Resolving social conflicts and field theory in social science. In: K. Lewin (Ed.): *Time perspective and morale* (pp. 80–93). Washington, DC: American Psychological Association.

Linden, A. N., Lau-Barraco, C., & Hollis, B. F. (2014). Associations between psychological distress and alcohol outcomes as mediated by time perspective orientation among college students. *Mental Health and Substance Use: Dual Diagnosis, 7*, 134–143.

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality and Social Psychology, 69*, 176–190. https://doi.org/10.1037//0022-3514.69.1.176.

McKay, M. T., Andretta, J. R., Magee, J., & Worrell, F. C. (2014). What do temporal profiles tell us about adolescent alcohol use? Results from a large sample in the United Kingdom. *Journal of Adolescence, 37*, 1319–1328.

McKay, M. T., Cole, J. C., & Percy, A. (2015a). Further evidence for a Bifactor solution for the consideration of future consequences scale: Measurement and conceptual implications. *Personality and Individual Differences, 83*, 219–222.

McKay, M. T., Morgan, G. B., Van Exel, N. J. A., & Worrell, F. C. (2015b). Back to 'the future': Evidence of a Bifactor solution for scores on the consideration of future consequences scale. *Journal of Personality Assessment, 97*, 395–402.

McKay, M. T., Cole, J. C., & Andretta, J. R. (2016a). Temporal profiles relate meaningfully to anxiety and depression in university undergraduates. *Personality and Individual Differences, 101*, 106–109.

McKay, M. T., Perry, J. L., Percy, A., & Cole, J. C. (2016b). Evidence for the reliability and validity, and some support for the practical utility of the two-factor consideration of future consequences Scale-14. *Personality and Individual Differences, 98*, 133–136.

McKay, M. T., Andretta, J. R., & Cole, J. C. (2017). How individuals feel about the past, present and future bears little relation to alcohol-related problems, anxiety, and depression: A person-centered analysis in a university sample. *Substance Use and Misuse, 52*, 734–741.

McKay, M. T., Perry, J. L., Cole, J. C., & Worrell, F. C. (2018). What time is it? Temporal psychology measures relate differently to alcohol-related health outcomes. *Addiction Research and Theory, 26*, 20–27.

Mello, Z. R., & Worrell, F. C. (2007). *The adolescent time inventory - English*. Berkeley: The University of California Retrieved from https://faculty.sfsu.edu/~zmello/content/adolescent-time-inventory.

Mello, Z. R., Zhang, J. W., Barber, S. J., Paoloni, V. C., Howell, R. T., & Worrell, F. C. (2016). Psychometric properties of time attitudes scores in young, middle and older adult samples. *Personality and Individual Differences, 101*, 57–61.

Muthén, L. K., & Muthén, B. O. (2012). *Mplus user's guide* (Seventh ed.). Los Angeles: Muthén & Muthén.

Saunders, J. B., Aasland, O. G., Babor, T. F., dela Fuente, J. R., & Grant, M. (1993). Development of the alcohol use disorders identification

test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction, 88*, 791–804.

Schmid, K. L., & Lopez, S. J. (2011). Positive pathways to adulthood: The role of hope in adolescents' constructions of their futures. In R. M. Lerner, J. V. Lerner, & J. B. Benson (Eds.), *Advances in child development and behavior, Vol. 41: Positive youth development* (pp. 69–88). San Diego: Elsevier.

Shipp, A. J., Edwards, J. R., & Schurer-Lambert, L. (2009). Conceptualization and measurement of temporal focus: The subjective experience of the past, present, and future. *Organizational Behavior and Human Decision Processes, 110*, 1–22. https://doi.org/10.1016/j.obhdp.2009.05.001.

Snaith, R. P., & Zigmond, A. S. (1994). *HADS: Hospital anxiety and depression scale*. Windsor: NFER Nelson.

Strathman, A., Gleicher, F., Boninger, D. S., & Edwards, C. S. (1994). The consideration of future consequences: Weighing immediate and distant outcomes of behavior. *Journal of Personality and Social Psychology, 66*, 742–752.

Sun, R. C. F., & Shek, D. T. L. (2013). Belies in the future as a positive youth development construct: A conceptual review. In D. T. L. Shek, R. C. F. Sun, & J. Merrick (Eds.), *Positive youth development: Theory, research and application* (pp. 13–26). Hauppauge: Nova Science.

Van Beek, W., Berghuis, H., Kerkhof, A., & Beekman, A. (2011). Time perspective, personality and psychopathology: Zimbardo's time perspective inventory in psychiatry. *Time and Society, 20*, 364–374.

Van Beek, J., Antonides, G., & Handgraaf, M. J. J. (2013). Eat now, exercise later: The relation between consideration of immediate and future consequences in healthy behavior. *Personality and Individual Differences, 54*, 785–791.

Vazquez, F., & Blanco, V. (2008). Prevalence of DSM-IV major depression among Spanish university students. *Journal of American College Health, 57*, 165–171.

Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta Psychiatrica Scandinavica, 67*, 361–370.

Zimbardo, P. G., & Boyd, J. N. (1999). Time perspective: A valid, reliable individual-differences metric. *Journal of Personality and Social Psychology, 77*, 1271–1288.

Zimbardo, P. G., & Boyd, J. N. (2008). *The time paradox: The new psychology of time*. London: Rider.